

Georgia Iron Works, 1899
620-640 12th Street
Augusta
Richmond County
Georgia

HAER GA-7

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47-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

GEORGIA IRON WORKS

HAER GA-7

Location: 620-640 12th Street
Augusta, Richmond County, Georgia
UTM:
Quad:

Date of Construction: ca. 1899

Present Owner: David Silver
Phoenix, Arizona

Present Use: In disuse.

Significance: Georgia Iron Works was one of the companies which was attracted by the cheap water power of the Augusta Canal. Its buildings still stand along the banks of the canal.

Historian: Alan J. Steiner, August 1977

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GEORGIA IRON WORKS

Executives at Georgia Iron Works in Grovetown, Georgia, still tell stories of the old days when few of the production workers at the company's Augusta plant could read and write. Workers in the machine shop memorized the instructions for their jobs, or scribbled them on the wall in personal codes. One day the owner of the Iron Works decided to spruce up the interior of his buildings. The machine shop crew arrived at work and discovered that their instructions lay beneath a fresh coat of paint. The machine shop immediately shut down its operations. [1] The empiricism, "family secrets, foremen's fancies, handicraft...[and] just plain mumbo-jumbo," and the traditional modes of metal-casting and machining at Georgia Iron Works, were to linger for many years before the company introduced more scientific methods. [2]

EARLY BUSINESS HISTORY

The Georgia Iron Works actually began its operations as the Warwick Machine Co., a jobbing foundry and machine shop in Augusta, Georgia. The company, incorporated on March 4, 1891, had a capital stock of \$12,000. [3] Two of the leading incorporators of the foundry were Thomas F. Warwick and Henry C. Perkins. Warwick, for whom the company was named, became manager of the works. Perkins, who also owned the Perkins Mfg. Co., a local lumber company, became President of the Warwick Machine Co. [4] The original buildings of the company were on or near the site of the Perkins Company's mill #2. [5] The company soon employed about forty workmen and set about the business of building

mill machinery and engines. [6]

In May 1892, the company changed its name to Georgia Iron Works, and during that year J. A. Hauser replaced Warwick as manager. [7] Hauser had some fourteen years' experience in "some of the largest saw-mill machinery houses in the country." [8] The new manager's background and Perkins' involvement with the lumber industry helped set the direction of the company. Georgia Iron Works specialized in "High Grade Heavy Saw Mill Machinery." [9] According to one source, the company was manufacturing equipment that Georgia sawmill owners once had to obtain from suppliers in the North and Northwest. [10] The machinery, built specifically for cypress and yellow pine mills, included "Fractional Head Blocks, Saw Dust Conveyors, Slab Conveyors, Log Haul Ups..., Edgers, Trimmers, Arbors, Jump Saws...and everything else for the complete equipment of mills." [11]

ORIGINAL SITES AND STRUCTURES

The original site of the Georgia Iron Works included 500 feet of frontage on Eleventh Street in Augusta. [12] The company erected three buildings. The main structure was a wooden two-story machine shop with a low-pitched metal roof, measuring 125 feet x 60 feet. A monitor running the length of the building improved the lighting and ventilation of the middle of the machine shop. [13] The company's foundry building was 60 feet x 80 feet. [14] A third structure, 35 feet x 75 feet, contained the boiler house, the erecting shop, and the blacksmith's shop. [15] The company was situated along the Augusta Canal, but was between two branches of the second level and thus had no drop and no water power

available. [16] The original Georgia Iron Works used steam power. [17]

Around 1899, Georgia Iron Works moved into new buildings on Twelfth Street between the second and third levels of the Augusta Canal. [18] The company built on land previously occupied by Sterling Cotton Mills and Georgia Paint Works, two companies which existed briefly during the 1870's and 1880's. [19] By 1890, nothing remained of either company except portions of their water power systems. [20] Georgia Iron Works widened the old tailrace of Sterling Cotton Mills and installed a vertical turbine in a brick wheelhouse topped by a wooden tower. [21] The vertical shaft of the turbine extended into the tower, where it drove a pulley. The pulley turned a 1,080-foot-long manila rope, which travelled above the yard of the works, entered the second story of the machine shop building, and turned a second pulley, which dropped the power down to the shop's shafting. [22]

The process of iron manufacturing began in a foundry approximately 130 feet long. The molders and their helpers shovelled sand into mold boxes set in wood patterns and hand- or air-rammed the molds. In the foundry's core room, core makers formed the inner dimensions for the molds. The foundry workers baked the cores and sand molds in an oven within the building to harden them. The molders melted the raw iron and core in two round brick cupolas. The molten iron went down to tapholes whose spouts entered the molding shop. The workers then caught the metal in buckets held on a circular crane. The hand-operated crane (see photos 4 and 5) covered a radius of 25 feet. The width of the molding shop was 50 feet, so a molder, with help, could move the hot bucket to his mold

and pour in the iron. After the molds had cooled, the molders "knocked the floors out" and removed the castings. The workers then placed the casts on a wagon--in later years, on a Ford truck--for transportation across the canal to the company's machine shop. [23]

In the machine shop, workers finished the castings. A tumbler room next to the wheelhouse and tower contained a round "rumbling mill," run by air power. The workers put castings in the rumbling mill, which tumbled the castings and cleaned and shined them in the process. [24] The finished casts then were shipped or stored in the company warehouse. [25]

Georgia Iron Works never used steam engines to power its rope drive. The company built a boiler and engine house which apparently contained a small dynamo to run the company's electric lights. While its original buildings on Eleventh Street had a steam heating system, the new Georgia Iron Works were heated with stoves. [26] Prior to the installation of an electric motor, the company may have used steam power to run the blower for the cupola. [27]

The buildings at the Georgia Iron Works were utilitarian brick shells. At its south end, the foundry building had two high open arches, which housed the tall cupolas. These openings facilitated the delivery of materials for cupola charging, left space for runways to the high cupola doors, and permitted the cooling of an extremely hot area. [28] The machine shop, the company's largest building, included a wing for a blacksmith's shop. [29] A monitor atop the building permitted better natural lighting for the work area. Between 1904 and 1923, the company

erected another plain brick building, which contained a general warehouse, the pattern shop, and the pattern warehouse. [30]

BUSINESS HISTORY TO 1947

During the early part of the 20th century, the management of Georgia Iron Works searched for work in which its foundry could specialize. The company still manufactured a whole line of foundry products, including portable sawmills; cast iron fire hydrants; lamp-posts; ornamental cast iron; and municipal castings (manhole covers, storm sewer covers and frames, and pipe fittings for water lines). [31] By 1913 Georgia Iron Works had begun to produce mining machinery for Florida phosphate fields. [32] Refined phosphate was used in the production of fertilizers. The first step in the process of phosphate mining and refining involved the removal of blanket-like ore deposits from the earth. Mining companies dug down to the deposits and, in a process called hydraulic mining, aimed high-pressure streams of water at the phosphate ore and washed the pebble-like deposits into a pit. The owners of Georgia Iron Works found the specialized work that they desired in the production of hydraulic nozzles for phosphate ore-washing. [33]

When America entered the First World War, the power shortages, production controls, and transportation crisis did not prevent the Florida phosphate mines from obtaining ore-washing equipment made in Georgia. The problem for mining companies lay in the acquisition of equipment to transfer and process the phosphate. After the ore was washed into a pit, the companies pumped the phosphate-sand-water mixture, called

slurry, through pipelines to refining plants. At the end of the pipeline, the slurry entered a five-foot diameter steel drum with rotating screens that initiated the separation of phosphate from the slurry. Small pumps transmitted the phosphate mixture around the plant for further refining. The procurement of pumps and replacement parts, which were manufactured primarily by the Morris Machine Works of New York, provided the most critical problem for the mines. [34]

Georgia Iron Works responded to this problem by undertaking, at first, the manufacture of pump parts, and then the production of pumps. Eventually the company made equipment for every part of phosphate mining, transferal, and processing system. The foundry produced the hydraulic nozzles, the slurry pumps, the couplings that connected pumps and motors, the rotating screens and smaller pumps for refining plants, and assorted gearing mechanisms and gear boxes. Georgia Iron Works soon established a steady, profitable business and a good reputation with the Florida phosphate mines. [35]

Until the late 1920's, J. A. Hauser, the original manager of the iron works, ran the operation. By 1927, Charles W. Beaufort, company superintendent for some 20 years, had replaced Hauser as vice-president of Georgia Iron Works. [36] As Beaufort advanced, he carried along his son-in-law, George C. Harding, who moved up from clerk to secretary of the company. [37] When Beaufort died in the 1930's, Harding became vice-president. [38] Although the presidency of Georgia Iron Works remained in the Perkins family, Harding ran the company. [39] It seems highly unlikely that any of the top management at Georgia Iron Works

during this period had any formal training in metallurgy. Hauser and Beaufort probably had learned all they knew by working their way up in various foundries. Whatever Harding knew about iron-making, he learned from Beaufort. [40] Since the workers also did not understand the scientific basis for their work, the company operated largely on tradition and the folklore of the industry that passed from older to younger workers. The management of Georgia Iron Works was fiscally conservative and failed to update the company's technology. [41] Yet Georgia Iron Works continued to profit, its officers drew good salaries, and the company piled up a backlog of orders. [42]

When Andrew Perkins, the company president, died around 1945, his estate sold his half of the company to George Floyd, who went into debt to make the acquisition. [43] Floyd expected to pay off his debts by drawing a large salary as vice-president. [44] Harding, who owned the other half of the company, had become president. The men could not agree on the matter, and Floyd had to sell his share of the company just to repay his loans. Harding was entering his sixties and was ready to sell his portion of the company and retire comfortably. By early 1947, Georgia Iron Works was available for purchase. [45]

A number of Augustans were looking for just this type of investment. The Hagler brothers, Tom and Carroll, unsuccessfully had attempted to acquire controlling interest in the Georgia-Carolina Brick & Tile Co., once owned by their family. Virgil Hollingsworth, a childhood friend of Tom Hagler's, had failed in an attempt to gain control of the Hollingsworth Candy Co. CPA George C. Baird, another friend of the

Haglers, had done the books for Georgia Iron Works and knew that the company had a backlog of orders. He also knew that the company had lost money only during the Depression, when the owners were drawing what he thought were excessive salaries. Furthermore, Baird realized that Georgia Iron Works had operated under soon to be lifted wartime price controls which prevented the company from increasing prices while costs rose. Here, believed the accountant, was a potential gold mine. The four men joined forces, obtained a bank loan, and purchased Georgia Iron Works for \$220,000. [46]

MODERNIZATION

The new owners found the company's operation unscientific and technologically backward. The Haglers, Hollingsworth, and Baird had not acquired Georgia Iron Works in order to exploit the company or drive it into the ground. Each man wanted the opportunity to exercise what he felt was stifled leadership potential. Hollingsworth, Chairman of the Board, Tom Hagler, President, J. Carroll Hagler, Vice-President, and George C. Baird, Secretary-Treasurer, decided to modernize the foundry. [47] In the next few years, the company would invest \$185,000 in new technology. [48]

The first new piece of equipment to arrive at Georgia Iron Works was the motorized sandslinger. With the sandslinger, the molder and his helper no longer shovelled sand into molds and air-rammed them. Instead, the molder placed the sand and some water into a muller, which mixed the materials. The resulting mixture went into a hopper bucket, which the molder put on the sandslinger. The new machine travelled up and down

the foundry on a track, and molders could swing it to any mold. When operated, the sandslinger would fill the mold with sand and ram it up. The new technology eliminated the need for molders' helpers, whom the management then could place on other jobs. Clyde Blackston, a molder at Georgia Iron Works since 1938, estimated that the installation of the sandslinger doubled the production of molds. [49]

Alvin Postell, at the time the company's maintenance man, was responsible for several post-1947 improvements made in the loading of the cupolas. For years, the molders had pushed wheelbarrow loads of iron and coke up a 30-foot runway to the cupola door and then dumped in the coke and threw in the iron. Postell revised this system by installing an electric hoist to raise the iron and coke to the cupola door. He later topped this improvement by putting in an automatic loader. The molder then loaded a bucket of iron or coke on the ground. The new machine lifted the bucket to the cupola door and automatically dumped its contents into the cupola. These technological changes eased the back-breaking work of the molders and contributed to increases in production per man. [50]

Another step toward modernization was the elimination of water power. Prior to 1947, the owners of Georgia Iron Works had installed an electric motor to run the rope drive when the canal was dry. John C. Hagler III, a son of Carroll Hagler, noticed that production seemed better when the company used the electric drive. The water wheel was designed to produce 75 horsepower. The young Hagler did some tests and found that only 47 hp was reaching the company's machinery. The

management accepted his recommendation to abandon the water wheel and employ the electric motor at all times. The owners maintained the rope drive, powered by a 100 hp motor, until 1953, when they placed motors on the individual line shafts. [51]

The determination of the owners of Georgia Iron Works was clear in their attempts to produce harder metals. In 1948, one of the Haglers attempted to obtain an order for 35 pumps from American Cyanamid. The chemical company wanted the pumps to be made of a very hard metal, a nickel-chromium alloy. Although Georgia Iron Works had produced only grey iron and semi-steel, Hagler insisted that his company could make the metal and the pump. Coining the term on the spot, he promised American Cyanamid pumps made of gasite. [52] Georgia Iron Works got the order, but no one at the company knew how to produce the desired alloy. Finally, a nickel salesman came to the plant and told the owners about a nickel-chromium alloy. The salesman's advice enabled the company to produce the metal and fill the order for pumps. [53]

Aware of their company's backwardness, the owners attempted to update their operation by observing the techniques used by other foundries. The company sent John C. Hagler III on tours of various foundries. He visited one foundry in Birmingham, Alabama, which particularly impressed him. The foundry used the patented Meehanite process, [54] which called for strict controls in the manufacture of metals. These laboratory-type controls appealed to Hagler's academic background in chemistry. He travelled to Chattanooga, Tennessee, and there visited another foundry using the Meehanite process. Again Hagler was impressed.

He returned to Augusta and asked the Meehanite Metal Corp. to make Georgia Iron Works a licensee for the manufacture of metals under their patents. The Meehanite Co. initially rejected the company as too backward. In December 1952, after the owners had poured funds into modernization, the Meehanite Corp. granted them a license. [55]

The installation of Meehanite controls at Georgia Iron Works required a testing laboratory and trained chemists, metallurgists, and engineers. Prior to the introduction of scientific methods in the foundry industry, the recipients of a finished product would describe the capabilities of the product to the iron works after it had operated in the field. Times had changed; the purchasers now insisted on specifying the exact standards for a piece of equipment before placing an order. [56] Meehanite controls permitted Georgia Iron Works to produce cast iron of superb quality and to guarantee the physical and chemical properties of their metals. [57]

The owners soon found that the company could produce more high-quality metal than was needed for the pump business. Rather than waste its capacity, Georgia Iron Works began to sell jobbing castings that did not require machining. The company put a salesman on jobbing castings, which became a larger and larger part of the foundry's business. The jobbing castings business differed from the pump business in that the customer, rather than Georgia Iron Works, designed the final product. The production of jobbing castings, while profitable, was not as steady as the production of pumps and replacement parts. The owners eventually moved their salesman back on to pumps. Soon the pump business increased

and the company could no longer afford to undertake small jobbings. By 1965 the owners were moving the company out of jobbing entirely. [58]

Modernization and new management at Georgia Iron Works had substantially increased production and profits. By the early 1960's, the company required more space than was available at its 3-acre Augusta site. In Grovetown, Georgia, about 20 miles from Augusta, the owners found abundant, cheap real estate and lower taxes. From 1962 to 1965, Georgia Iron Works moved into new buildings on a 100-acre site in Grovetown. The company transferred some of its machinery and also purchased new equipment. [59] Blanche Mills, an adjacent textile manufacturer, purchased the buildings as warehouses until 1972, when that company ceased operations. [60] Since then the buildings have remained vacant, and the old wheelhouse and tower have burned down. [61] The now silent and overgrown foundry presented an amazing contrast to the booming operation in Grovetown.

The new Georgia Iron Works carried out all the processed of pump manufacturing under one roof, except for pattern making. The company made additional technological changes. Workers melted the various metals in electric induction furnaces rather than cupolas, and molders filled their shells with "no-bake" sand, which hardened by itself. Alvin Postell, who had become vice-president in charge of manufacturing, had led the way in the company's development of a special sand reclamation system. The owners, still unafraid to spend money to improve the operation, installed a computer system to aid in information storage and in the chemical and structural analysis of materials and products. [62]

Shiny new testing machinery and scientific controls, however, could not dispel this visitor's feeling that something totally immeasurable had affected the owners and a number of the employees at Georgia Iron Works. Once, said Alvin Postell, recalling the days prior to modernization and the company's real take-off, "we was po' folks." [63] Participation in the enactment of a rags-to-riches story had given many of the people connected with Georgia Iron Works the inspiration and unabashed confidence derived from being "born again," technologically.

Footnotes

1. Unrecorded interview with John C. Hagler III, Jimmy Hewett, and Alvin Postell at Georgia Iron Works, Grovetown, Georgia, 3 August 1977. At the time of the interview, John C. Hagler III was Chairman of the Board, Jimmy Hewett was a supervisor, and Alvin Postell was vice-president in charge of manufacturing. (Hereafter referred to as Unrecorded Interview.)
2. Bruce L. Simpson, History of the Metalcasting Industry (Chicago, 1969), p. 233.
3. Charters 1889-1900, Book I, pp. 79-81, Minutes of the Superior Court of Richmond County, Municipal Building, Augusta, Georgia.
4. Augusta City Directory, 1891, Vol. X, p. 420. Warwick, in 1889, was a mater mechanic for the Central Railroad.
5. Sanborn Fire Insurance Maps, 1884, Map Room, Sciences Library, University of Georgia, Athens, Georgia. (Hereafter referred to as Fire Ins. Maps.) Augusta City Directory 1891 shows address as corner of Eleventh and Fenwick.
6. Augusta Exchange Club, compiler, Industrial Advantages of Augusta, Georgia (Augusta, 1893), pp. 79-80. (Hereafter referred to as Industrial.)
7. Charters 1889-1900, Book I, pp. 245-6, Minutes of the Superior Court of Richmond County, Municipal Building, Augusta, Georgia; Howard's Directory of Augusta 1892-93, Vol. I (Augusta, 1892), p. 223. Warwick was listed as a machinist and plumber, p. 514. The company's capital went up to \$41,000. Maloney Directory Co.'s Augusta 1896-97, p. 350.
8. Industrial, p. 80.
9. Industrial, p. 79.
10. Industrial, p. 79.
11. Industrial, pp. 79-80.
12. Industrial, p. 79.
13. Industrial, p. 79. Photograph of machine shop building appears on p. 79.
14. Industrial, p. 79.

15. Industrial, p. 79.
16. Fire Ins. Maps. Augusta City Directories list the first Georgia Iron Works as at the corner of 11th and Fenwick (1891), 11th Street between D'Antignac and Fenwick (1892-3), 11th between Talcot and Fenwick (1895-6), 11th between Talcot and Calhoun (1898-9). These addresses all locate the original Georgia Iron Works in the vicinity of two branches of the second level of the Augusta Canal. For information on the canal, see HAER, Augusta Canal Project, Report #1.
17. Industrial, p. 79. Mentions use of electric lights and steam heat, but nothing about power.
18. Augusta City Directory 1901, Vol. XVI, (Atlanta, 1901), p. 283; lists the address of Georgia Iron Works as 620-40 Twelfth.
19. See Fire Ins. Maps. For information on Sterling Cotton Mills, see William Whatley, A History of the Textile Development of Augusta, Georgia (unpublished M.S. thesis, University of South Carolina, 1964). The Georgia Paint Company or Paint Works were manufacturers of mixed paints, Georgia Red and Georgia Golden Ochres. D. B. Plumb was president. Sholes' Augusta City Directory 1882, (Augusta, 1882), p. 63, p. 208. This 1882 listing was the only one the author could find for the paint company existing in the city directories. Prior to the buildings of these two plants, the land served as the site of a Confederate pistol factory. See Earl L. Bell, "Augusta-Made Confederate Colts," Augusta Magazine (Fall 1969), pp. 14-16.
20. See Fire Ins. Maps.
21. Fire Ins. Maps; recorded interview with Clyde Blackston and L. A. "Lonnie" Jones, at Georgia Iron Works, Grovetown, Georgia, August 17, 1977. Clyde Blackston worked at Georgia Iron Works as a molder since 1939. L. A. Jones worked in the core room at Georgia Iron Works beginning in 1936. Neither Clyde nor Lonnie nor others interviewed knew the manufacturer of the turbine, which remains underground in its pit. (Hereafter referred to as Recorded Interview.)
22. Recorded Interview. Verified length in phone conversation, August 24, 1977, also that drive was rope, not cable. "I should know, I spliced it," said Alvin. Discussion with Alvin Postell, July 22, 1977, at Georgia Iron Works.
23. Recorded Interview. Statistics were those given by Clyde Blackston, and the molder used the term "knocked the floors out."
24. Recorded Interview.
25. The other buildings at Georgia Iron Works included an office building, a chipping shed, an oil room, and an area for iron storage. In

1904, Georgia Iron Works had no fire apparatus. By 1923, the company had pails of water available and the boiler house had automatic sprinklers. See Fire Ins. Maps.

26. Fire Ins. Maps.
27. The foundry never was run directly by water power. At an unknown date, the company installed an air compressor which ran off an overhead shaft. The compressed air was used to power a crane and air-ramming equipment in the foundry. Recorded Interview.
28. Recorded Interview.
29. Fire Ins. Maps.
30. Fire Ins. Maps.
31. Unrecorded Interview. Information from John C. Hagler III, who learned this from George C. Harding, ex-president, who stayed on for six months after the sale of the company in 1947 to help the Hadlers get going.
32. See R. L. Polk & Co.'s Augusta Directory, 1913 (Augusta, Georgia), p. 356.
33. Unrecorded Interview. Film "Performance--the Augusta Iron Works Story," viewed 3 August 1977 at Georgia Iron Works.
34. All information from Unrecorded Interview.
35. All information from Unrecorded Interview.
36. Polk's Augusta City Directory, 1927 (Richmond, Virginia, 1927), p. 279. No Hausers are listed in that year's directory.
37. Polk's Augusta City Directory, 1927 (Richmond, Virginia, 1927), p. 279. An earlier directory (1925) lists Harding as a clerk at Georgia Iron Works. Harding was originally a New Yorker. In the Army during the First World War, Harding, as a lieutenant, was stationed at Camp Hancock in Georgia. After the War ended, he decided that he liked the Southern climate. He met and married Charles Beaufort's daughter Marie and worked at Georgia Iron Works. Unrecorded Interview.
38. Polk's Augusta City Directory, 1934 (Richmond, Virginia, 1934), p. 219. Beaufort is not listed in the 1934 directory; I assume that he died.
39. Andrew C. Perkins had replaced Henry C. Perkins as president by 1908.

According to Clyde Blackston, although Perkins was president, Harding was "the wheel."

40. Unrecorded Interview.
41. Clyde Blackston noted that Harding "never spent too much money to improve the business." Recorded Interview.
42. Unrecorded Interview.
43. Unrecorded Interview.
44. Polk's Augusta City Directory, 1946 (Richmond, Virginia, 1946), p. 185. Floyd's background is unknown to the author.
45. Unrecorded Interview.
46. Unrecorded Interview.
47. Polk's Augusta City Directory, 1947-48 (Richmond, Virginia, 1947), p. 189; Polk's Augusta City Directory, 1949 (Richmond, Virginia, 1949), p. 206.
48. Unrecorded Interview.
49. Recorded Interview.
50. Recorded Interview.
51. Unrecorded Interview.
52. Hagler picked gasite as the name for the promised metal to stand for Georgia (GA) and because "site" sounded hard. Unrecorded Interview.
53. Unrecorded Interview.
54. The Meehanite Metal Corporation was organized on 28 January 1888 as the Meehanite Brake Shoe Foundry. The company now is located in Chattanooga, Tennessee. Phone conversation with secretary, Meehanite Corp., 26 August 1977.
55. Unrecorded Interview.
56. Recorded Interview.
57. Unrecorded Interview.
58. Unrecorded Interview.
59. Phone conversation with John C. Hagler III, 25 August 1977.

60. See HAER, Augusta Canal Project, Report #9, Globe Mill.
61. The turbine remains in the ground.
62. The author obtained this information from the company's film, "Performance--the Georgia Iron Works Story" and a tour of the plant, 3 August 1977.
63. Discussion with Alvin Postell, 22 July 1977, at the Georgia Iron Works.

Bibliography

Oral Interviews

John C. Hagler III, Jimmy Hewett, and Alvin Postell at Georgia Iron Works, Grovetown, Georgia, 3 August 1977. Unrecorded.

Mr. Hagler provided much of the information about the early history of the company and about the purchase and modernization of Georgia Iron Works.

Clyde Blackston, molder, and L. A. "Lonnie" Jones, core maker, at Georgia Iron Works, Grovetown, Georgia, 17 August 1977. Recorded.

Mr. Blackston gave detailed information on the water power system at Georgia Iron Works and on the operation of the foundry and its modernization.

Maps

Sanborn Fire Insurance Maps, 1884, 1890, 1904, 1923. Map Room, Sciences Library, University of Georgia, Athens.

Books

Simpson, Bruce L. History of the Metalcasting Industry. Chicago, 1969.

The final chapters cover metalcasting in the last three centuries and supplied some background for the study.

Augusta Exchange Club, compiler. Industrial Advantages of Augusta, Georgia. Augusta, 1893.

Provided information on the original Georgia Iron Works.

Augusta City Directories.

City Records

Minutes of the Superior Court of Richmond County, Georgia. 1889-1900.

Contained incorporation approvals.